

Master Projects Software Analysis and Transformation

Short agile feedback loops

Keywords: workflow diagrams, code generation, UI design, Cloud/serverless, Rascal MPL

Supervisors: Jurgen Vinju (CWI) and Tim Soethout (ING)

More information:

- ING is interested in enabling short agile feedback loops of prototyping financial (b2b and b2c) services
- Non green fields situation (integrating in existing systems)
- Model driven engineering

The project may be hosted at TUE/CWI (not hired by ING).

Static Analysis across language boundaries

Keywords: Rascal MPL, Code to model, Security

Supervisor: Jurgen Vinju (CWI/TUE)

More information:

- Static analysis across language boundaries
- Example cross-language interactions
 - Webclient (Js/TypeScript) / Webserver (Java)
 - Java/JNI/{C, Python, Ada}
 - C#/F#
 - Remote Procedure Calls (XML-RPC, JSON-RPC)
- Reverse engineering data and control flow
 - Connecting the dots
 - Removing (trusted) implementation layers
- Can we make this scale?
 - Effort per language/framework?
 - (Modular) Analysis efficiency?

This project may be hosted at TUE/CWI.

RADCAL: new semantics for arithmetic

Keywords: JVM, arithmetic, Midpoint Radius Algebra

Supervisor: Jurgen Vinju (CWI/TUE)

More information:

- RADCAL: new semantics for arithmetic
 - RadCal is a design for programming language arithmetic with 100% exact rationals, and automatic precision management for reals based on midpoint radius algebra.
 - No more floating point errors

- No more implicit inaccuracy
- No more cumulative errors
- Looking for a Java/OO specialist to prototype and evaluate smart implementations on the JVM
- Learn from open-source competitors
- Make it fast, faster, fastest.
- For applications in DSLs and Rascal MPL

This project may be hosted at TUE/CWI.

Philips Image Guided Therapy

Keywords: C++, Architecture Degredation, IDEs, Rascal, CLaiR

Supervisors: Jurgen Vinju and Mathijs Schuts

More information:

- Philips Image Guided Therapy
- Architecture Degradation Analysis in the IDE
 - Bring architectural guidelines into VScode C++
 - Rascal and ClaiR for fact extraction/analysis
- Questions?
 - What is a concise and maintainable method of specifying practical architecture degradation patterns?
 - What is the accuracy of the patterns? How can they be improved?
 - How to bring ADA to the IDE?

This project may be hosted at TUE/CWI.

ICTU is overheidsorgaan voor digitalisering

Keywords: Python, Web, Continuous Integration, Rascal, Python AIR

Supervisors: Jurgen Vinju and Frank Niessink

More information:

- ICTU is overheidsorgaan voor digitalisering
- Architecture Degradation Analysis: Python
 - Static Analysis of Weakly typed language
 - Rascal and Python-Air for fact extraction/analysis
 - Questions?
 - What is a concise and maintainable method of specifying practical architecture degradation patterns?
 - What is the accuracy of the patterns? How can they be improved?
 - How to bring ADA to continuous integration?

This project may be hosted at TUE/CWI.